REMARKS

Claims 131-151 are pending in the case. Claims 135 and 142 have been amended to recite that the claimed processes "consist of" the steps recited therein, rather than "consist essentially of" the steps recited therein.

Applicants express most sincere appreciation for the indication in the Office Action that Claims 131-134 are allowable.

Rejection under §103(a)

Claims 135-151 still stand rejected under 35 U.S.C. §103(a) as obvious over Goodenough et al. (U.S. 3,588,503) in view of Dallmier et al. (U.S. 5,683,654) and the Second Declaration of McKinnie (Exhibit 1073 in Interferences 105,222 and 105,223).

The Response to Arguments section of the Office Action is addressed first, since the arguments regarding the cited references and the rejection based thereon are essentially the same as those presented in previous Responses to Office Actions in this case.

On the last two lines of Page 4 of the Office Action, it is stated that the "consisting essentially of" language in the claims would permit bromine sources other than bromine (Br_2). But the claims recite " ... components consisting of (i) bromine and ... ." Thus, the ingredients in the process were previously restricted to those listed in the claims.

In this connection, the last paragraph on Page 5 of the Office Action, continuing on to Page 6, states that the "consisting essentially of" language permits a step in the presently claimed processes to raise the pH of the solution to a value in the range of 12 to 14 at the end of the process. Applicants point out that there is no need for such a step at the end of the process when the pH has been kept in that range throughout the process as claimed. However, to avoid further prosecution delays, the claims have been amended to recite that the process steps "consist of."

On Page 6, lines 18-22 (last two full sentences), it is stated that the combination of Goodenough and Dallmier is "obvious since both references individually are drawn to biocides containing the same chemical components." This is inaccurate. From the

components added in each of these references, the reactions that occur are generally accepted to be as shown:

$$Br_2 + H_2O \rightarrow HOBr + HBr \quad \text{(Goodenough);}$$

and $$NaBr + NaOCl \rightarrow NaOBr + NaCl \quad \text{(Dallmier).}$$

These reactions are fundamentally different. Dallmier needs to add an oxidant to form the biocide, while Goodenough does not; Dallmier adds two substances to form the biocide; Goodenough only adds one. Further, the reaction of bromine with water is generally accepted to be instantaneous; the reaction in Dallmier requires waiting for a period of time (column 3, lines 62-65, and Example 1 at column 7, lines 60-63). At a minimum, there is no bromide (Br^-) in the Dallmier system, and no chlorine-containing reagent is added to the Goodenough system to form the biocide. Applicants also mention that the present claims are process claims, not composition claims.

We turn now to the arguments present in the rejection itself. All of the Office Actions issued from September 17, 2009, onward (five, inclusive of the present Office Action) contain the same sole §103(a) rejection over Goodenough in view of Dallmier et al. and McKinnie. As these arguments are the same as presented in previous Office Action, the arguments in response thereto are also the same or similar. Some of the points made in the rejection in the Office Action are addressed below.

To support the rejection, the Office Action suggests that the mixing of magnesium hydroxide with sulfamic acid in accordance with Goodenough results in an alkaline earth metal salt of sulfamic acid which is functionally equivalent to the instant alkali metal salt (sodium) of sulfamic acid (Office Action, Page 2, last sentence). However, the results achieved as between the alkaline earth metal (Mg) salt of sulfamic acid and the alkali metal salt (Na) of sulfamic acid are considerably different from each other, as shown in the Declaration of inventor Dr. Christopher J. Nalepa, originally submitted in another case (Appln. No. 09/785,890), a copy of which was submitted with the previous Response on May 11, 2011. For the Declaration, the preparation of Solution B from Goodenough's Example 3 was repeated, both as described in Goodenough with $Mg(OH)_2$, and by replacing the $Mg(OH)_2$ with an equimolar amount (based on hydroxide) of NaOH. In these experiments, a final pH of 13 or greater was not attained with either hydroxide. The pH of the solution prepared with $Mg(OH)_2$ was 8.75, while the solution prepared with NaOH had a pH of 11.55.

Thus, Goodenough does not show solutions having a pH of about 13 or greater, regardless of whether the hydroxide is $Mg(OH)_2$ or an alkali metal hydroxide (Declaration of Nalepa, paragraph 6, Table 1).

In this connection, the repeated preparation of Solution B from Goodenough's Example 3, and the analogous preparation with NaOH, as described in the Declaration of Nalepa, provided interesting results. In particular, the stability (as measured by activity in ppm Br_2) is significantly *lower* for solution made with *sodium* hydroxide. After four days, the solution prepared with NaOH retained only 69% of its original activity, while the solution prepared with $Mg(OH)_2$ as in Goodenough retained 97% of its original activity (Declaration of Nalepa, paragraph 9, Table 2). Clearly, the teachings of Goodenough indicate that alkali metal bases provide solutions which are inferior for retention of activity. This indicates that the presently claimed solutions do provide unexpected results – much higher retention of activity while using an alkali metal base; see Example 2, in which the solution retained more than 95% of its active bromine content after 6 weeks at ambient temperature.

The Office Action maintains that Dallmier makes it obvious to raise the final pH of the solution to a value in the range of 12 to 14 on Page 3, lines 11-13 (latter part of second paragraph) and on Page 4, lines 2-6, of the Office Action. The present claims need not have a step to increase the pH to about 12 to 14 because the pH is kept in that range throughout the claimed processes. The improper combination of Goodenough and Dallmier does not make obvious a process in which the pH is at a high value at all times during the process. In addition, inventor Nalepa explains that having the pH at a very high value throughout the process, especially by adding the entire amount of base initially, provides biocidal solutions that have greater thermal stability than solutions obtained by preparations at lower basic pH values and then raising the pH to the final high pH value. See paragraph 7 of the Second Declaration of inventor Dr. Christopher J. Nalepa, originally submitted in another case (Appln. No. 09/785,890), a copy of which Second Declaration accompanies this Response.

On Page 4, at lines 7-11 (second paragraph), of the Office Action, the active bromine content is stated to make the rejected claims obvious. Goodenough mentions that the bromine values can reach 100,000 ppm (column 1, lines 39-42). Preferred bromine values in Goodenough have an upper limit of 50,000 ppm (column 2, lines 65-69). The Examples of Goodenough use $27^1/_2$ ppm (Table I); 1760 ppm or 1820 ppm (Table II); and about 10,000

ppm (Example 3, at column 4, lines 74-75). Goodenough thus encourages formation of solutions with significantly lower amounts of active bromine than 100,000 ppm. It would not have been obvious to one of ordinary skill in the art to make a solution with a high amount of active bromine, such as at least about 100,000 ppm, especially in light of Goodenough's remarks immediately following the disclosure of the upper limit of 100,000 ppm bromine values:

> The bromine values in these solutions, however, are susceptible to decomposition during storage and prior to use and the solutions lose their beneficial properties. (Column 1, lines 42-45.)

This statement implies that such high concentrations of active bromine are wasteful, and thereby discourages high concentrations of active bromine. Thus, the present claims are nonobvious over the cited references for this additional reason.

Arguments regarding points in the Office Action not addressed above (*e.g.*, all of the reasons that Goodenough and Dallmier are incompatible and form an improper combination, the order of addition of the reagents, *etc.*) are incorporated by reference from the previous Response.

In light of the foregoing amendments and remarks, the case is believed to be in condition for allowance. Prompt notification to this effect would be sincerely appreciated.

If any matters remain that require further consideration, the Examiner is requested to telephone the undersigned at the number given below so that such matters may be discussed, and if possible, promptly resolved.

Please continue to address all correspondence in this Application to Albemarle Corporation, at their address of record.

Respectfully submitted,

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